



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|----------------------------------|-------------|----------------------|---------------------|------------------|
| 10/751,421 | 01/06/2004 | Masaru Fuse | 2003_1755 | 3207 |
| 513 | 7590 | 04/07/2006 | EXAMINER | |
| WENDEROTH, LIND & PONACK, L.L.P. | | | SINGH, DALZID E | |
| 2033 K STREET N. W. | | | ART UNIT | |
| SUITE 800 | | | PAPER NUMBER | |
| WASHINGTON, DC 20006-1021 | | | 2613 | |

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

A

Office Action Summary**Application No.**

10/751,421

Applicant(s)

FUSE ET AL.

Examiner

Dalzid Singh

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 62,67,68,70-72,74,75 and 81 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 62,67,68,70-72,74 and 81 is/are rejected.
- 7) ☒ Claim(s) 75 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 62, 67, 68, 70-72, 74 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (US Patent No. 5,896,211) in view of Naito et al (US Patent No. 5,568,305).

Regarding claim 62, Watanabe discloses optical communication system, as shown in Fig. 13, comprising:

an optical modulating portion (41-1 to 41-k) operable to convert an angle-modulated signal (ASK, FSK, PSK, AM, FM and PM) into the optical-modulated signal (see Fig. 5);

an optical branch portion ((81) shown in Fig. 13) operable to branch the optical-modulated signal outputted from said optical modulating portion into at least two signals, a first optical-modulated signal and a second optical-modulated signal;

an interference portion operable to separate the first optical-modulated signal outputted from said optical branch portion into a plurality of optical signals having a predetermined difference in propagation delay and to then combine the optical signals so as to form a combined optical signal (the interference portion split the optical signal

into part A and part B, wherein part B is delayed by a predetermined amount and then combined the optical signal to form a combined optical signal);

wherein the predetermined difference in propagation delay is determined such that the first optical/electrical converting portion is operable to output a base band signal (see col. 11, line 54-55, since the higher frequency is neglected, therefore the base band signal is determined); and

first optical/electrical converting portion comprises a first optical/electrical converting portion and a second optical/electrical converting portion (each element (91-1 to 91-k) comprise optical/electrical converting portion to convert the optical signal into electrical signal).

Watanabe does not disclose that the second optical-modulated signal is received by the second optical/electrical converting portion. However, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide direct connection such that the second optical signal branched from the optical branch unit, is received by the second optical/electrical converting portion without passing through delay element.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical

communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Furthermore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to modify the Fig. 13 of Watanabe such that the second optical signal branched from the optical branch unit, is received by the second optical/electrical converting portion without passing through delay element.

Regarding claim 67, in Fig. 16, Watanabe shows a local light source (Lo-LD2) operable to output a light of a predetermined wavelength; and an optical combining portion, inserted between said optical branch portion (121) and said second optical/electrical converting portion, operable to combine the second optical-modulated signal outputted from said optical branch portion and the light from said local light source, wherein said second optical/electrical converting portion is operable to heterodyne detect the combined optical signal outputted from said optical combining portion and then to convert the optical signal into an electrical signal.

Regarding claim 68, in Fig. 17, Watanabe shows a local light source (45) operable to output a light of a predetermined wavelength; and an optical combining portion (46), inserted between said optical modulating portion (43) and said optical branch portion (47), operable to combine the optical-modulated signal outputted from said optical modulating portion and the light from said local light source, wherein said

second optical/electrical converting portion (48) is operable to heterodyne detect the second optical-modulated signal outputted from said optical branch portion and the optical-modulated signal into an electrical signal.

Regarding claim 70, as shown in Fig. 16, Watanabe shows a local oscillation portion (Lo-LD1) operable to convert an unmodulated signal of a predetermined frequency and an optical/electrical converting portion (104) operable to convert the combined optical signals into an electrical signal.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 71, as shown in Fig. 16, Watanabe shows a local oscillation portion (Lo-LD1) operable to output an unmodulated signal of a predetermined frequency, a mixing portion and an optical/electrical converting portion (104) operable to convert the combined optical signals into an electrical signal.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 72, in Fig. 16 Watanabe shows an angle modulating portion (ASK, FSK, PSK, AM, FM AND PM) operable to convert a first electrical signal into an angle-modulated signal;

a combining portion (31-1 to 31-k) operable to combine the angle-modulated signal and a second electrical signal (f_1 to f_k);

an optical modulating portion (33) operable to convert the combined signal outputted from said combining portion into an optical modulated signal; and

an optical branch portion ((81 shown in Fig. 13) operable to branch the optical modulated signal outputted from said optical modulating portion into at least two signals, a first optical-modulated signal and a second optical-modulated signal, wherein said interference portion is operable to branch the first optical modulated signal outputted

from said optical branch portion into a plurality of optical signals (portion A and portion B) having predetermined difference in propagation delay and then to combine the optical signals, wherein said optical/electrical converting portion (104) comprises a first optical/electrical converting portion and a second optical/electrical converting portion, wherein said first optical/electrical converting portion.

Watanabe discloses an optical/electrical converting portion, as discussed above, and differ from the claimed invention in that Watanabe does not disclose that the optical/electrical converting portion having square-law-detection characteristics. However, in optical reception circuit it is well known to provide optical/electrical converter having square-law detection characteristics. Naito et al is cited to show such well known concept. In col. 1, lines 29-34, Naito et al photodiode used in optical communication system having square-law detection. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to replace the optical/electrical converter of Watanabe with that of Naito et al. One of ordinary skill in the art would have been motivated to do such in order to obtain maximum detection of the optical signal.

Regarding claim 74, as shown in Fig. 13, Watanabe shows that a first signal processing portion (91-1) operable to limit the occupied frequency band of the first electrical signal; and a second signal processing portion (91-2) operable to limit the occupied frequency band of the second electrical signal.

Regarding claim 81, the combination of Watanabe and Naito et al does not disclose that the second optical-modulated signal is not separated into a plurality of

optical signals having a predetermined difference in propagation delay. However, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to not separate the second optical-modulated signal in order to provide direct detection.

Allowable Subject Matter

3. Claim 75 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

4. Applicant's arguments with respect to claim 62 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS
April 3, 2006

David Singh